

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Service Rules for the 698-746, 747-762)	WT Docket No. 06-150
and 777-792 MHz Bands)	
)	
Implementing a Nationwide, Broadband,)	PS Docket No. 06-229
Interoperable Public Safety Network in the)	
700 MHz Band)	
)	
Amendment of Part 90 of the Commission's Rules)	WP Docket No. 07-100

**COMMENTS OF THE DENVER REGIONAL TRANSPORTATION
DISTRICT, IN RESPONSE TO FIFTH NOTICE OF PROPOSED
RULEMAKING**

The Regional Transportation District (RTD), a statutory political subdivision of the State of Colorado, hereby submits the following comments in response to the Commission's Fifth Notice of Proposed Rulemaking, FCC 12-61, released June 13, 2011 (Fifth NPRM), in the above-captioned proceedings in which the Commission is seeking comments on a wide variety of technical issues and proposed rules for broadband deployment in the 4.9 GHz band public safety spectrum.

Introduction and Summary of RTD's Position

RTD is the mass transit provider for the Denver metro area, and is currently building commuter rail and light rail lines throughout the District. Granting use of the 4.9 GHz frequency to commercial uses may jeopardize RTD's and other public safety uses as discussed below, including Positive Train Control wireless systems mandated by the federal government in response to recent fatal train collisions.

The Fifth NPRM provides an overview regarding the Commission's understanding of the

use of the 4.9 GHz public safety band and a discussion of alternatives for use of the entire band in the future. While RTD respects the Commission's analysis and recommendations, RTD believes that many of the options addressed in the NPRM, if adopted, will encourage the commercial development of the 4.9 GHz band to the detriment of current and future public safety users, including RTD. Further, RTD believes that allowing commercial use of the spectrum, even if public safety users are given preference, will inherently create hurdles for future public safety uses of the spectrum—including for applications that are available now, and high-bandwidth applications that are sure to be developed in the future.

Some of the Commission's recommendations, such as the registration of all base or fixed facilities or the fixed assignment of operating channels, are not consistent with RTD's planned operation of a high-speed 4.9 GHz public safety mobile data network. Further, based on RTD's region-wide implementation, RTD's network will use the entire 4.9 GHz band in defined rail corridors and in targeted areas along the corridor (e.g., depot facilities, passenger stations, and transfer points). This is a long-term project that was approved by the Federal Transit Administration in November of 2009. RTD anticipates that the project will require several decades for completion. Clearly, RTD needs to have assurance that adequate, interference-free spectrum will be available to support RTD's network as the system is constructed. RTD therefore seriously question the feasibility of sharing the 4.9 GHz public safety spectrum with non-public safety users as direct licensees of this spectrum.

Facts About RTD and RTD's Use of the 4.9 GHz Spectrum

RTD was organized in 1969 and is the regional authority operating public transit services in eight of the twelve counties in the Denver-Aurora-Boulder Combined Statistical Area in Colorado. RTD is governed by a 15-member, publicly elected Board of Directors. Directors are elected to a four-year term and represent a specific district.

RTD operates a bus and light rail system that has a service area of 2,337 square miles. In 2008, it carried more than 102 million riders. RTD is currently implementing a voter-approved regional rapid transit expansion that will add 122 miles of new commuter rail and light rail by extending three existing corridors and adding six new corridors; the extension anticipates the region's transportation needs as its population grows from 2.8 million to an expected 4.2 million by 2035. The implementation schedule calls for completion of the first segment of this "FasTracks Program" in mid-2013; that rail line will run west 12.1 miles from Denver Union Station to the Jefferson County Government Center.

As a part of this multi-billion-dollar project, which has been in process since 2004, RTD will be constructing a high-capacity 4.9 GHz mobile radio network that will be used to support a variety of public safety functions, primarily focused on multi-channel real-time incident video transmission within the commuter network and at key RTD transit facilities, supporting the operation of the RTD policing forces region-wide at vehicle depots, transportation transfer points, and other similar strategic locations, and Positive Train Control (PTC) systems.

As part of RTD's Commuter Rail (CR) design, PTC data will be interweaved into the 4.9 GHz channel. Critically, the Rail Safety Improvement Act of 2008 mandates that freight, intercity passenger and commuter rail routes have operable PTC in place no later than December 31, 2015 to ensure roadway worker safety and civil speed control, and to prevent collisions and derailments on railways in the United States. Undisturbed use of the 4.9 GHz channel is essential for compliance with this federal public-safety mandate.

PTC is an integrated command, control, communications, and information system for controlling train movements with safety, security, and efficiency. PTC systems are being implemented in this project to reduce the probability of collisions between trains and injuries to roadway workers, and to monitor train speeds. The PTC infrastructure consists of digital data link

communications networks, continuous and positioning systems integrated with onboard computers with digitized maps on locomotives and maintenance-of-way equipment, in-cab displays, throttle-brake interfaces on locomotives, wayside interface units at switches and wayside detectors, and control center computers and displays. The remote intervention capability of PTC will permit the control center to stop a train should the locomotive crew be incapacitated. In addition to providing a greater level of safety and security, PTC systems also enable a railroad to run scheduled operations and provide improved running time, greater running time reliability, higher asset utilization, and greater track capacity.

In order for the train control Back Office Servers (BOS) at the Operation Control Center to receive the necessary train-to-wayside communications to implement PTC, it is necessary that data transmitted on the 4.9 GHz spectrum be reliably received along the entire route served by RTD's rail network.

RTD's primary rationale for selecting the 4.9 GHz band for deployment was the availability of relatively interference-free spectrum within RTD's geographical large service area, along with a number of critical technical criteria, including bandwidth and propagation characteristics. The 4.9 GHz band as currently constituted represents the most desirable spectrum for RTD's critical public safety applications such as real-time mobile incident video and PTC .

For RTD's commuter rail lines extending from Wheat Ridge, Colorado to Denver International Airport, RTD's 4.9 GHz mobile radio network implementation plan calls for base station sites to be installed at intervals of 2.5 miles or less along the eventual 34-mile right-of-way. Each of the base stations will communicate to RTD's central operations center over a dedicated fiber optic backbone network traversing the length of the rail network.

Comments Relating to Commission's Notice

In the section entitled "Coordination" (§§19-24), the Commission examines the pros and cons of coordinating users within a given geographical area. Much of the discussion focuses on fixed sites, and more specifically point-to-point and point-to-multipoint links. However, RTD's use of the 4.9 GHz band is instead base to mobile and point to multi-point broadband.

The initial applications proposed for the 4.9 GHz band were for the deployment of broadband mobile and fixed portable applications. Along the corridor of RTD's rail line RTD will essentially blanket RTD's entire jurisdiction with 4.9 GHz access points to support a wide range of fixed and mobile rail clients. RTD understands that other transit authorities in other communities are using the 4.9 GHz mobile option for public safety applications deployment as well. RTD therefore recommends that, if local coordination committees are established, they have wide latitude to deal with a blanketing deployment and, at the same time, develop a methodology to support and protect the deployment of 4.9 GHz technology for point-to-point applications. RTD would note, however, that there are other established options for point-to-point applications for non-public safety users. For example, the Commission, under Part 101, has a long-established procedure for implementing high-capacity point-to-point links in both the 6 GHz and 11 GHz bands. Further, a review of the commercial literature provides technical information and strategies for implementing low-cost 5.8 GHz integrated point-to-point unlicensed microwave technology. All of these alternatives would be better in terms of public safety than release of the 4.9 GHz band to commercial use.

Under the section entitled "Registration and database approach" (§§25), the Commission examines the merit of creating a comprehensive database of permanent fixed point-to-point, point-to-multipoint, and base-to-mobile sites, and suggests that all such facilities would need to be entered into the database. If the 4.9 GHz band is to be released to commercial use, RTD

supports such databases for commercial sites, but RTD believes that such registration for certain public safety applications is unnecessary and, in fact, unduly burdensome for the public licensee. The Commission states the proposed database would aid in preventing interference but in the prior section (24) the Commission acknowledges that permissible interference standards do not exist in this band. As noted in RTD's attached design document, the first phase of the RTD 4.9 GHz public safety network includes as many as 10 to 20 inline wireless access points. As RTD implements the project may require additional access points due to propagation anomalies. Further, RTD's network will not employ static channel allocations within the 50 MHz bandwidth; rather, all devices will be dynamically controlled by software at the central network management center, which will continuously monitor the performance and loading of the network and automatically reconfigure the network to address real-time user requirements. In essence, the RTD public safety network is active (in compliance with the terms of RTD's FCC license) and will potentially use the entire 50 MHz band throughout the network at all times. The current policies of permitting geographic licensing is consistent with RTD's needs, again another reason RTD was attracted to the 4.9 GHz plan for our implementation.

In the section entitled "Registration and database approach" (34) Coordination, RTD supports coordination among public safety users to minimize coordination expenses. RTD applied for and was granted a license for its application, call sign WQPC914. This license should afford protection of these frequencies for the licensed application. When conflicts arise, RTD must coordinate with other local jurisdictions to mitigate frequency re-use or share resources. RTD would support the RPC as the arbiter and final authority pursuant to the Commissions delegation of that role.

In the section entitled "Expanding Eligibility and Alternative Licensing" (§42-45), the Commission examines the impact of expanding the eligibility of directly licensing non-public

safety users. Comment is requested on the feasibility of public safety sharing this unique band with other, non-public safety users. While the emphasis is on retaining public safety as the primary licensee, consideration appears to be given to a secondary license for non-public safety users. With regard to the RTD 4.9 GHz broadband wireless public safety network, RTD considers this approach to be unworkable. During the planning and design of the network, RTD examined the feasibility of sharing a wide range of spectrum; RTD finally selected the 4.9GHz band as the only viable option for our application. This is because RTD's public safety needs dictate a robust network that can reliably transport real-time, high-quality, multi-site video from RTD's trains 24/7 without the risk of interference or degradation from other users. Only the full 4.9 GHz spectrum can guarantee that level of public safety communications capability. Further, the 4.9 GHz band was initially established exclusively for public safety agencies—which gave RTD the confidence to invest substantial local and federal funds to develop and implement a discrete wireless network operating in the 4.9 GHz band. Based on our substantial investment in the 4.9 GHz technology and our long-term public safety deployment goals, RTD sees no practical opportunity within RTD operational areas for safe use of the spectrum by non-public safety entities in this region. Even if there were available spectrum now, our public safety needs will only grow as the FasTracks corridors expand over the next decades.

In the section entitled “FirstNet eligibility” (§§50-51), the Commission requests comments on the First Responder Network Authority (FirstNet) use of 4.9 GHz spectrum for backhaul on the proposed 700 MHz Long Term Evolution (LTE) network. This use of the 4.9 GHz spectrum for backhaul for LTE sites will require many sites, thus many point-to-point 4.9 GHz links that are likely to be high power. This creates significant potential for interference with those agencies using 4.9 GHz in a point-to-multipoint configuration. Additionally, the LTE network is for public safety entities that could license this spectrum in partnership with FirstNet, if deemed appropriate.

Therefore, there is no need to provide this eligibility to FirstNet. RTD believes that the rules should not be changed to allow for this expansion of eligibility. Changing the eligibility qualifications for Public Safety status would set an undesirable precedent.

In the section entitled “Standards” (§§64-67), the Commission discusses the pros and cons of establishing standards for this technology. As part of our implementation of the RTD 4.9 GHz public safety network, our planners examined a wide range of open and proprietary solutions. While certain proprietary technologies, or open solutions provided by a limited number of vendors, might have provided enhanced operating performance, it was our view that a more open technology such as those based on internationally accepted IEEE 802.xx holds the greatest potential for both meeting user requirements and providing a viable degree of interoperability. For RTD’s specific application RTD has already chosen the IEEE 802.16 WiMax standard which RTD believes will provide the best trade-off between reliable high speed mobile propagation, interoperability, functionality, and cost.

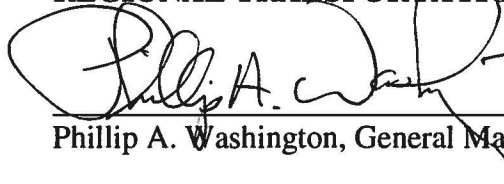
Based on RTD’s experience, RTD recommends that technology standards be adopted as a local option, particularly when users have a very specific application such as in the case with RTD. Due to the long term nature of RTD’s application RTD does not want to preclude a future move to LTE and LTE Advanced when equipment availability makes this a feasible option for the 4.9 GHz spectrum. This might be done as a part of the process of coordinating operating parameters within the public safety community. In other words, one of the parameters considered as part of licensing and coordination with adjacent and overlapping jurisdictions might be network protocols and any bridging assets that permit interoperability with coordinating communities.

CONCLUSION

For the reasons set forth above, the Regional Transportation District urges the Commission to refrain from adopting rules that require registration of all base stations facilities, restrict the dynamic deployment of operation channels within the 50 MHz bandwidth, or change the eligibility of the licensing of the 4.9 GHz Public Safety Spectrum.

Respectfully submitted,

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